



# **Beaumont/Port Arthur Photochemical Modeling**

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**30 Pages**



# Beaumont/Port Arthur Modeling Status

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## Overview

- Review of two ozone episodes being modeled for (Beaumont/Port Arthur) BPA attainment demonstration
- Status of BPA modeling protocol and conceptual model
- Status of meteorological modeling efforts- both episodes



# Beaumont/Port Arthur Modeling Status

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## Overview

- Review of base case performance for both episodes
- Future case inventory development
- Documentation
- Timeline



## Two BPA ozone episodes

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- We are modeling two ozone episodes for the BPA attainment demonstration:
  - “Local” episode – August 10-13, 2000 – 1 1-hour exceedance day (8/12) and two 8-hour exceedance days (8/12-13)
  - Extended TexAQS episode – August 23- September 6, 2000 – 3 1-hour exceedance days (8-30-9/1) and 8 8-hour exceedance days (Aug 19, 21, 30, 31, Sept 1, 2, 4, and 6) – major transport from HG on 8/30-9/1



# BPA Modeling Protocol and Conceptual Model Revisions

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- A revised protocol, including discussion of future base case and attainment demonstration, has been drafted.
- Conceptual model of BPA ozone formation, including VOC canister and some aircraft data analyses, being updated.
- Protocol and conceptual model being sent to EPA around January 15.



# Meteorological modeling

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## August 23-September 6, 2000 episode

- For extended TexAQS episode, Texas A&M built original wind fields (MM5).
- In order to improve CAMx performance, the core TexAQS episode (August 23- September 1) was remodeled with MM5 using GOES satellite data assimilation.
- Rest of extended TexAQS episode has not been rerun with GOES assimilation, but will be upon receipt of GOES processed data.
- Additional met-based CAMx sensitivities will be run afterward and assessed during comment period.



# Meteorological modeling

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## August 10-13, 2000 episode

- August 10-13, 2000 episode modeled with MM5 in-house.
- Initial analysis shows good met model performance.
- Time-permitting (during comment period), would like to remodel with GOES assimilation as a sensitivity.



# Base case CAMx model performance

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**August 10-13, 2000**

- Performance evaluation shows it meeting EPA statistical criteria (bias, gross error).
- Episode is performing well enough to go forward as a basis for the attainment demonstration





# Base case CAMx model performance

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**August 23-September 6, 2000**

- EPA statistical criteria was not met on Sept. 1 (due to bias) and Sept 5 (due to both bias and gross error).
- Performance during rest of episode was acceptable on 7 of the 9 days.
- Performance could be improved via GOES assimilation and incorporation of “Big Smoky” flare and huge butene release seen in aircraft canister (for August 30).



## **“Big Smoky” flare – August 30, 2000**

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# Base case CAMx model improvements

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- Include:
  - Adding emissions from Big Smoky flare and huge butene release on Aug 30 (target is January 23)
  - Apply HRVOC adjustments to BPA sources (target - January 23)
  - Running CAMx at 1-km resolution (target - January 23)
  - GOES assimilation for met modeling (as a sensitivity, during comment period)



# Future case inventory development

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- Continuing work on this
  - Close to having 2007/2010 inventories complete for area, nonroad, on-road, and point sources
  - Complete by 2/1/04



# Documentation

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- Modeling documentation has already commenced; completion pending on the components (e.g., base case inventory, performance evaluation, future case inventory, control strategy testing, etc.)
- Target is to complete all modeling documentation by 3/15/04 (in time for start of administrative process)



# Timeline

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Base case  
completed

Future case EI  
completed and control  
strategy runs start

Control strategy runs and  
all documentation  
completed

Jan 23, 2004

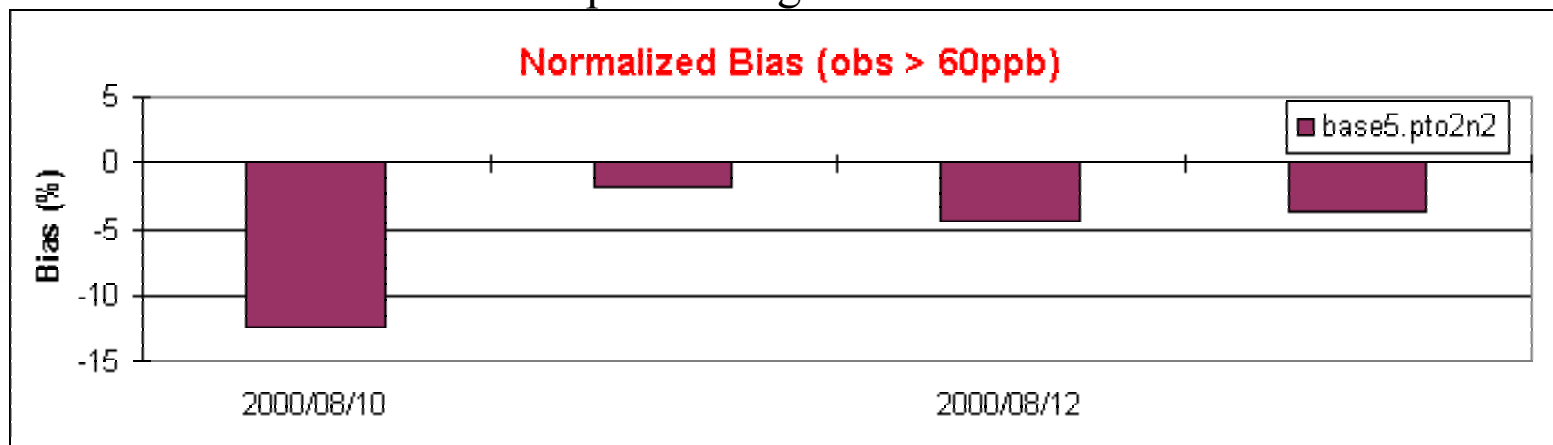
Feb 1, 2004

March 15, 2004

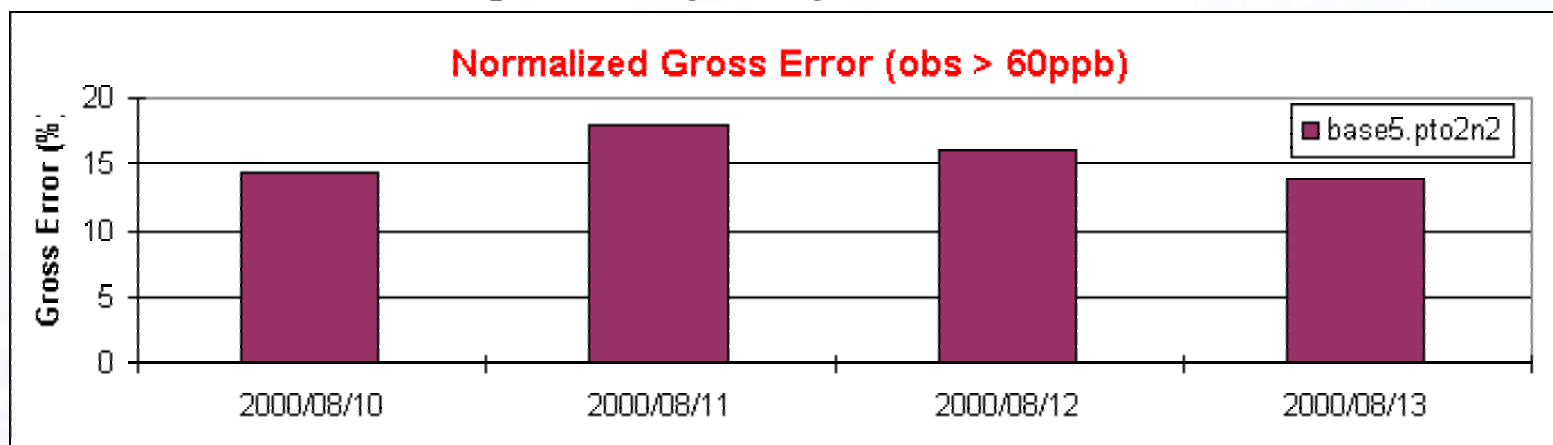


# August 10-13, 2000 episode

Acceptable range for bias: +/- 5-15%

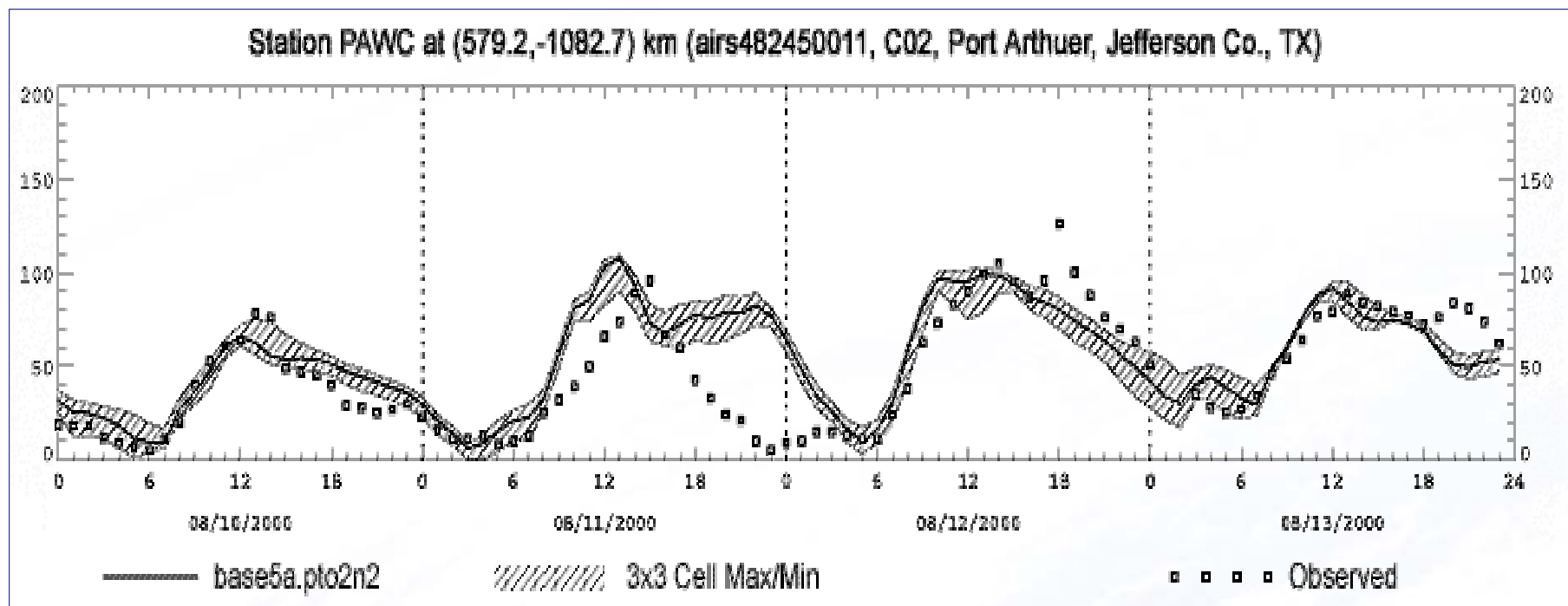


Acceptable range for gross error: 30-35%





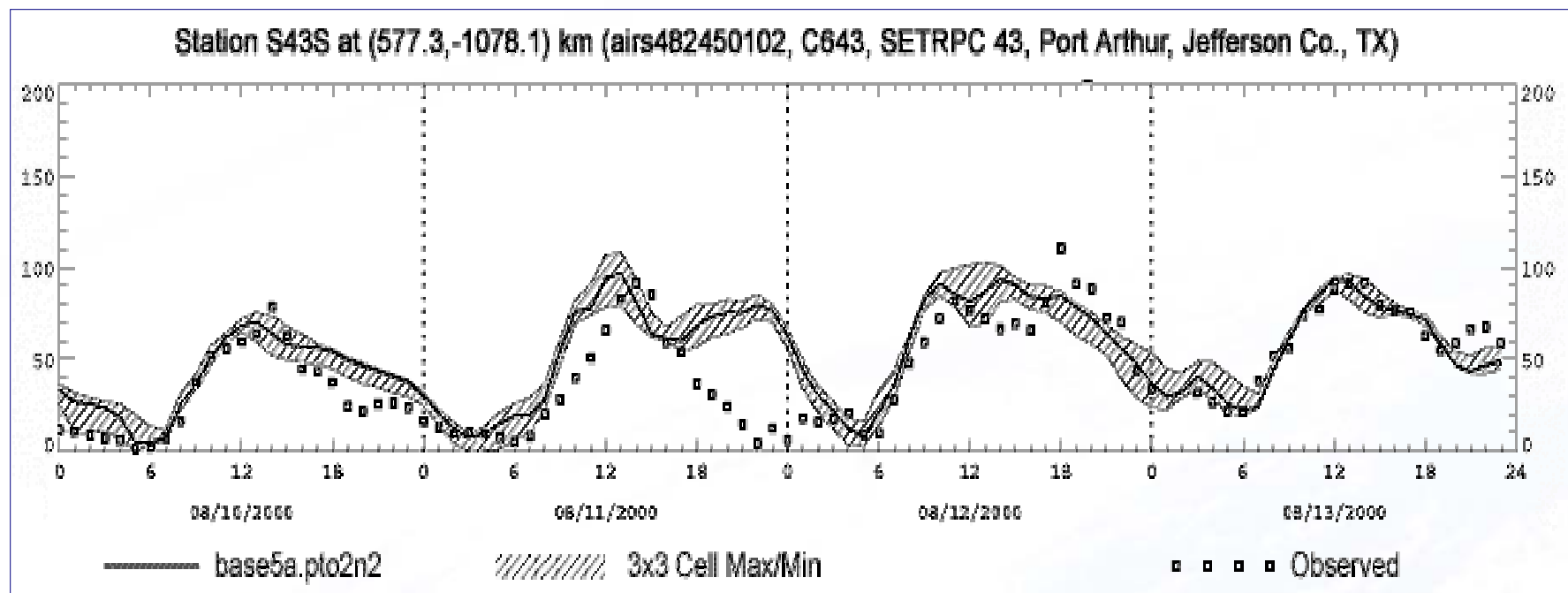
# **Time series for 8/10-13/2000 at CAMS28**





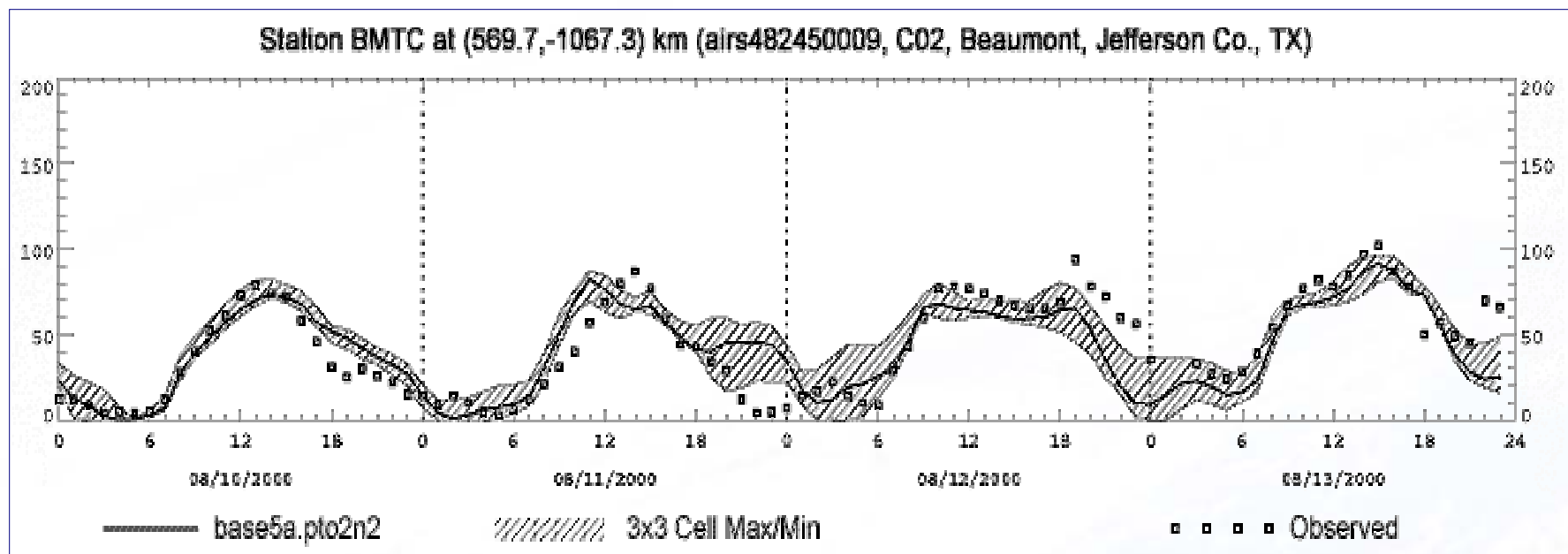


# Time series for 8/10-13/2000 at Jefferson County Airport (SETRPC S643S)



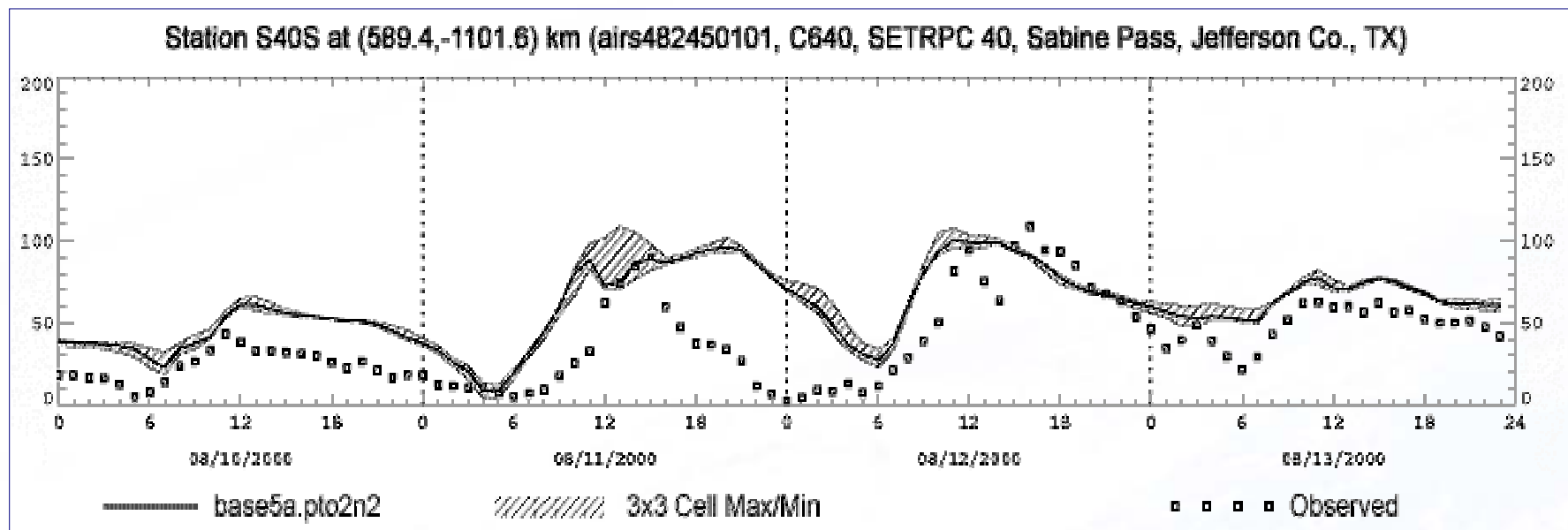


# Time series for 8/10-13/2000 at CAMS2



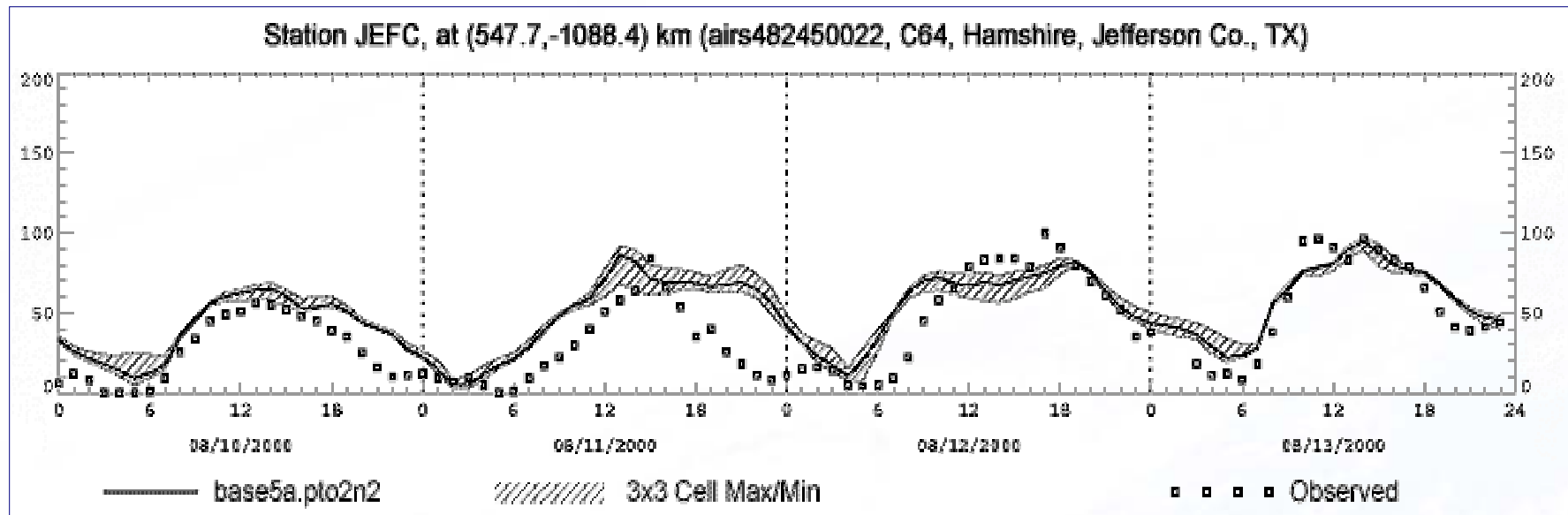


# Sabine Pass SETRPC S640S



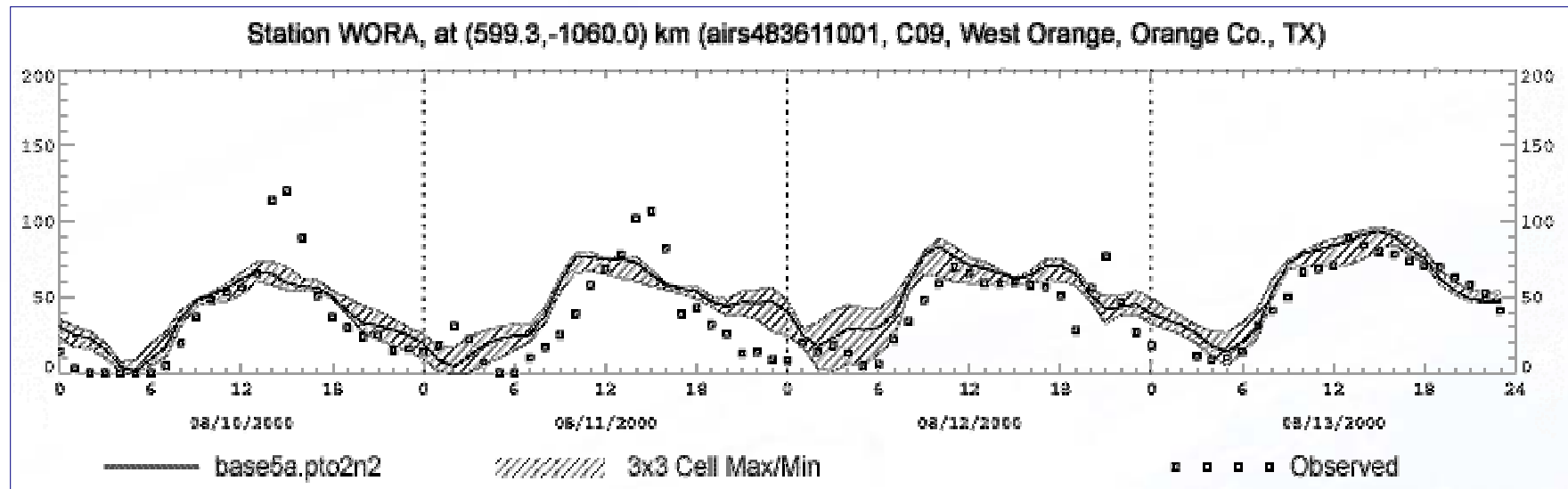


# CAMS64 - Hamshire



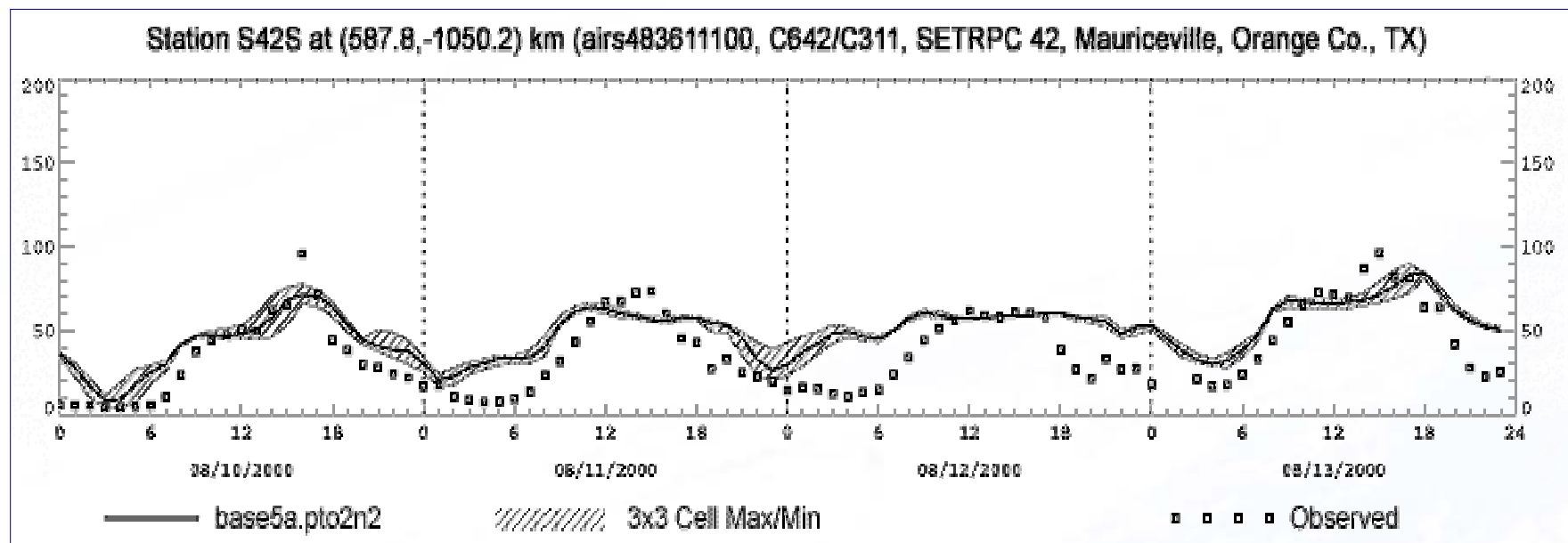


# West Orange - CAMS9





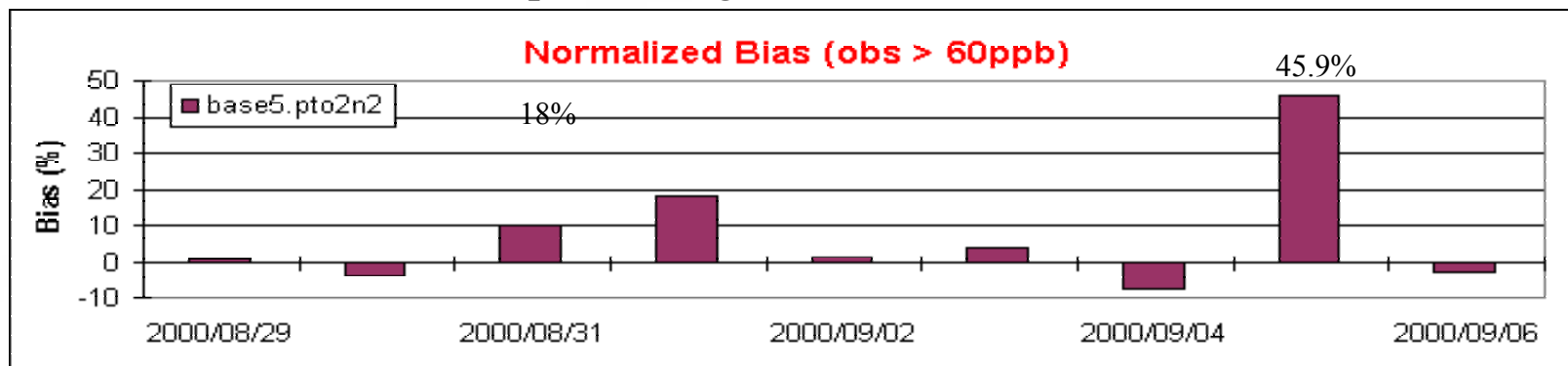
# Mauriceville – SETRPC S642S



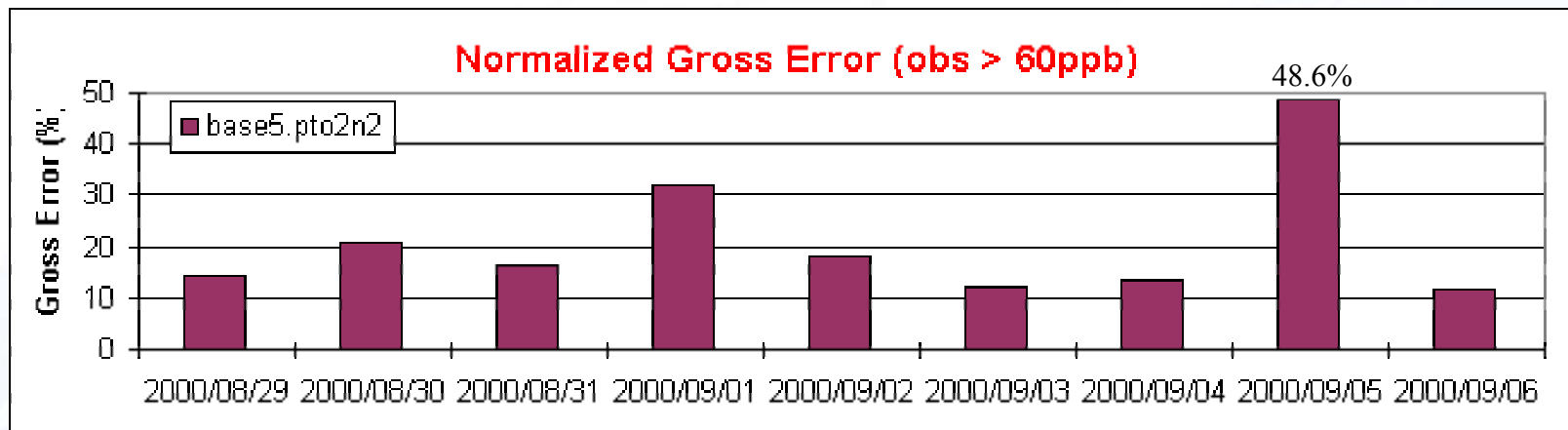


# Excerpt from August 23 – September 6, 2000

Acceptable range for bias: +/- 5-15%

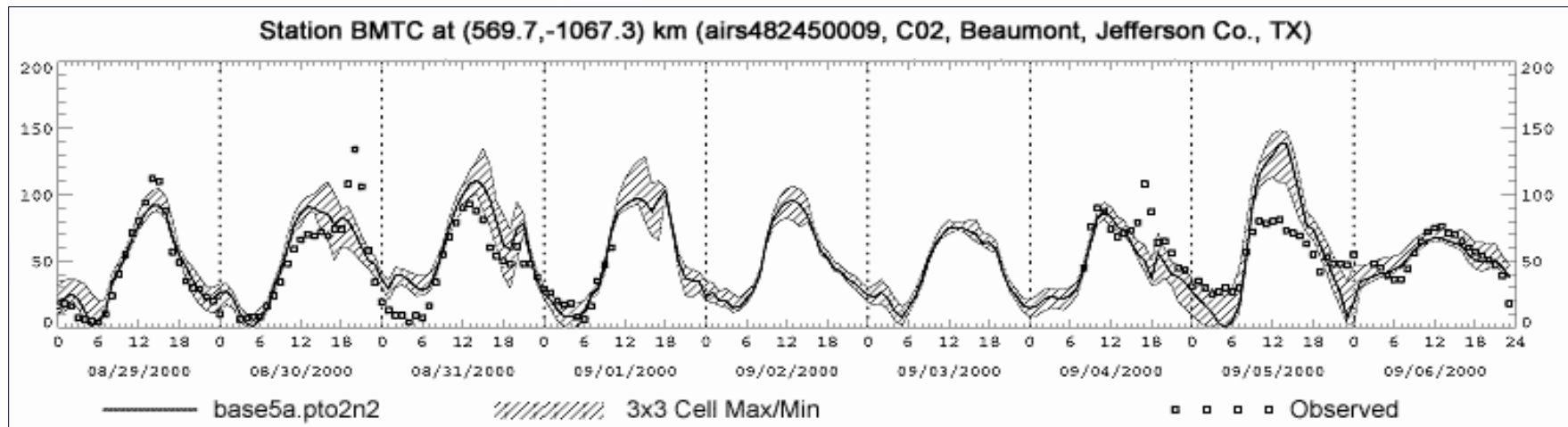


Acceptable range for gross error: 30-35%





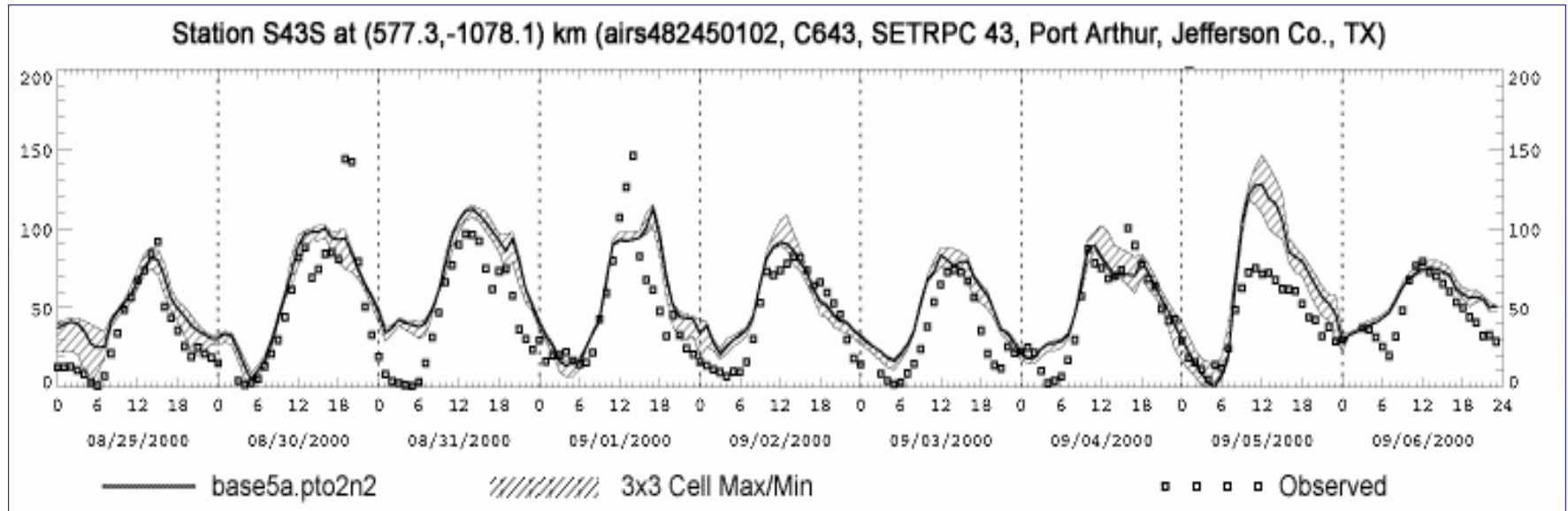
# Time series for core+second half of extended TexAQS episode (8/29-9/6) – CAMS2 Beaumont





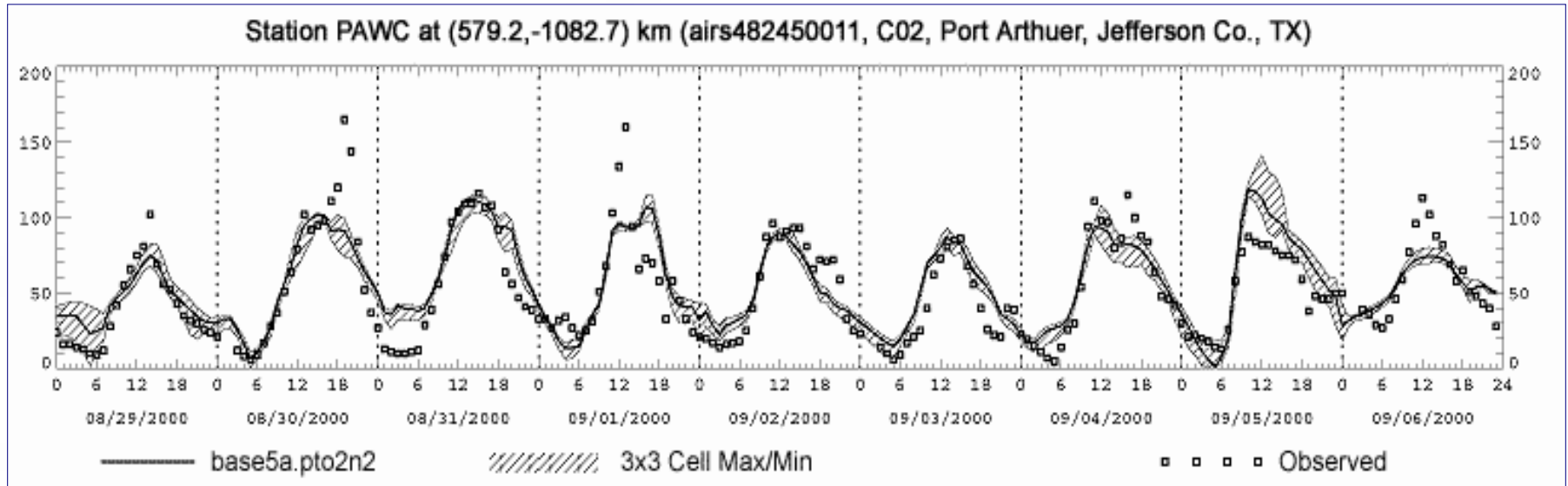


## Time series for core+second half of extended TexAQS episode (8/29-9/6) – SETRPC S643S Jefferson County Airport



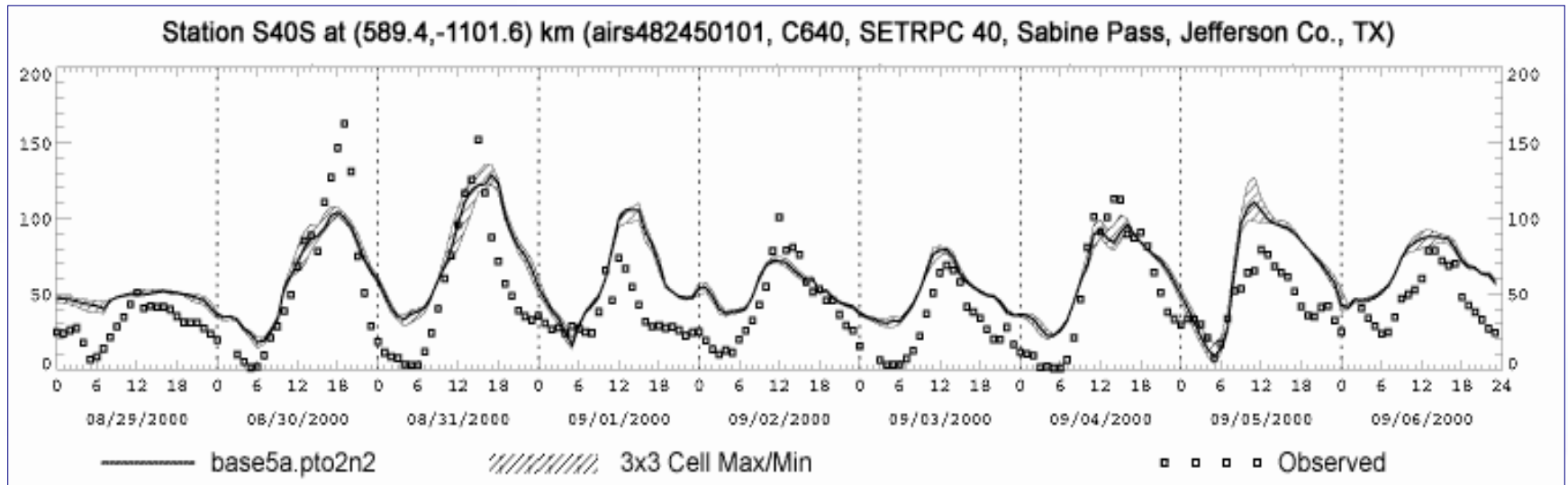


## Time series for core+second half of extended TexAQS episode (8/29-9/6) – CAMS28 Port Arthur West





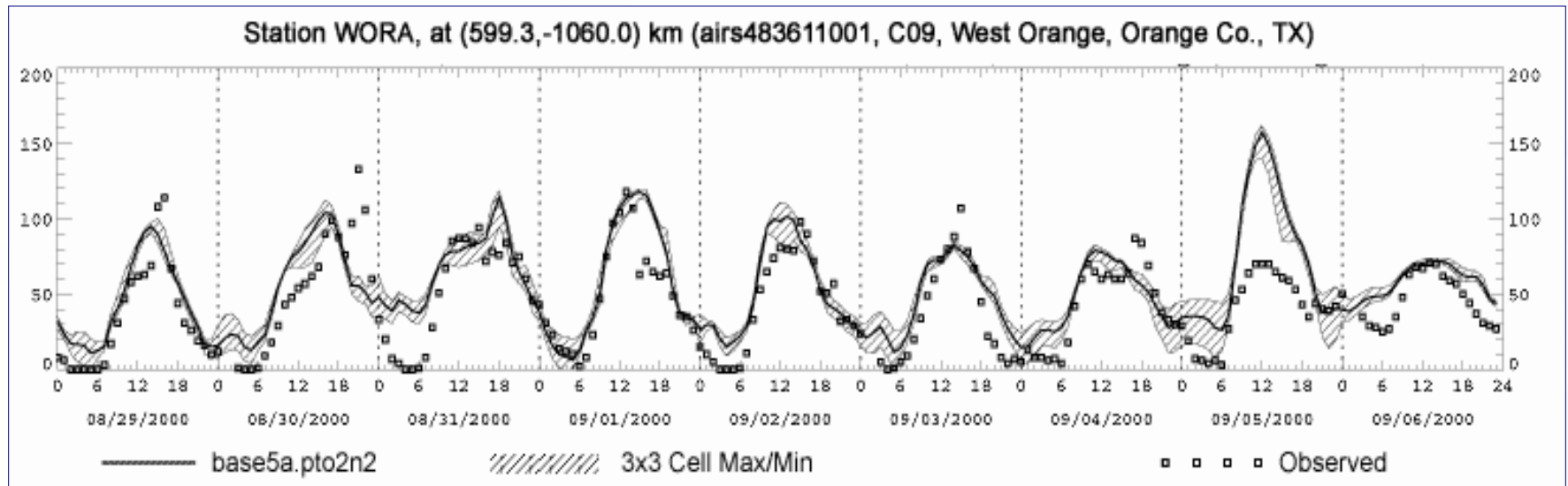
# Time series for core+second half of extended TexAQS episode (8/29-9/6) – SETRPC S640S Sabine Pass







# Time series for core+second half of extended TexAQS episode (8/29-9/6) – CAMS9 West Orange





# Time series for core+second half of extended TexAQS episode (8/29-9/6) – SETRPC S642S Mauriceville

